



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET—SUITE 500
DENVER COLORADO 80202-2405

Ref: 8HWM-SR

Mr. John Krueger
Department of Energy
Rocky Flats Plant
P. O. Box 928
Golden, Colorado 80402

Dear John:

We have completed our review of the Remedial Investigation Report for High Priority Sites (881 Hillside Area) at the Rocky Flats site. Our comments follow.

In general, the Remedial Investigation (RI) is missing the detailed evaluations necessary in an RI to support a subsequent study and remedy selection. The text frequently reflects the absence of technical review and several sections of the report appear to have been written prior to data evaluation. Our general concerns include the following:

- o A conclusions section is missing at the end of the report. A summary of what was learned from the RI should be presented here as well as any findings related to initial remedial technology screening.
- o The risk evaluation section is too generic (i.e., should be more site-specific).
- o Data summaries should include tabular and graphical presentations of the significant parameters of concern.
- o Site maps are not well referenced. Sampling points were difficult to locate.

ADMIN RECORD

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REVIEWED FOR CLASSIFICATION
By [Signature]
Date 6/1/82

A-DU01-000104

- o Data lacked quality control/quality assurance evaluations. Also, analytical detection limits and parameter standards levels were not presented.
- o Data and evaluations from past investigations are not integrated with that from the current RI.

I believe it would be beneficial if we could set up a meeting in the near future to discuss the above comments as well as the enclosed general and specific comments. By focusing now on additions needed to the RI report, we can better ensure the successful conclusion of the RI/FS process in the months to come. Please call me at your earliest convenience at (303) 293-1518.

Sincerely,


James L. Littlejohn
Remedial Project Manager

Enclosure

cc: Nat Muiullo, RCTA
Peter Bierbaum, CDH
Patty Fuller, CDM

GENERAL COMMENTS

- 1 Section 2.0, Regional Setting and Site Features, is quite thorough. However, this information is not integrated in the data interpretations. For example, the significance of the geology/soils with potential contaminant migration is never evaluated. Is this area a potential recharge zone for deeper bedrock aquifers, and has this possibility been addressed?

The basis for selection of sampling locations, analytical parameters, sampling methods, and analytical methods are not presented. These are necessary for an adequate evaluation of the results, and conclusions in the report rely heavily on these. For example, soil gas sampling locations are extensive across the site; however, the method is not described. Radionuclide data may indicate contamination for some isotopes; however, analytical methods and detection limits are not provided. The basis for selection of the radionuclides is not clear. What about decay and possible daughter products? Has this been considered adequately?

2. All EPA and CDH guidance or action levels for transuranic compounds in air, soil, and water should be summarized in a table with uniform units in order to facilitate comparisons with collected data. In addition, discussion should address the fact that much of this guidance has not been finalized. This report gives the impression that finalized standards and criteria exist, which is not true.
3. Drinking water criteria for VOCs should also be summarized and compared to ground water and surface water VOC data
4. The entire evaluation of the air exposure pathway is based on filters which primarily collect particulates that are 0.01-1.0 microns in size (page 6-1). This data is not representative of all particles actually respired and potentially lodged within the respiratory system. Maximum deposition in alveoli (60%) occurs with particles 3 microns in size, maximum deposition in the lungs as a whole (100%) occurs with particles 10 microns in size. Deposition in the lungs also occurs with particles up to 15 microns in size. See EPA (1982) and Cowherd et al. (1985) for a review of this issue. In addition, the possibility of larger particle sizes being ingested should be addressed
5. Although potential receptors were quantified, no risk was ever quantified because it was assumed that the receptors would not be exposed. The RI needs to quantify the potential risks should exposures occur. Typically, the maximum plausible exposure is quantified as well as the average exposure

SPECIFIC COMMENTS

1. Page EX-4, last paragraph - A site map is needed for reader orientation. The elevated organics and radionuclides should be identified.
2. Page EX-4, second paragraph, last sentence - The reference cited does not propose radionuclide drinking water standards.
3. Page 1-7, Section 1-1 - This report describes the results of remedial investigations at only one of the high priority sites.
4. Page 1-8, Section 1 4 - The previous investigations outlined here include all those conducted at Rocky Flats. A breakdown of those activities conducted at the 881 Hillside only is needed.
5. Page 3-1 - For the 9 soil samples for which results are not yet available, a map or description of the location and SWMUs from which these samples were taken would be helpful.
6. Table 3-1, page 3-2 - The parameter list should include the analytical methods. Also, at some point in this section the analytical detection limits should be presented, and compared to appropriate health standards. Further, the basis for selection of these parameters should be stated in the text.
7. Page 3-3, last paragraph - The postulated lab or field contamination with methylene chloride should be evaluated with lab or field blanks.
8. Table 3-2, page 3-4 - The meaning of the analytical ranges reported with "U" indicators is unclear. Explain how ranges can be given for values less than detection limits.
9. Page 3-5, first paragraph - The misidentification of a SWMU location does not necessarily preclude it as a source of environmental contamination.
10. Page 3-5, third paragraph - Soil gas results for SWMU 103, as well as other units discussed later, have been used to revise the location of these units. However, the possibility of migration (via gas or aqueous phase) is not discussed. In other words, due to migration, soil gas results may not exactly coincide with the original disposal location, but may be used to evaluate the direction and magnitude of migration (i.e., soil gas results may reflect a contaminant plume).
11. Page 3-15, Sections 3 9 and 3 10 - It is not clear whether soil samples were collected at SWMUs 145 and 177. If they were not, samples should be collected and analyzed to confirm that these sites are not sources of contamination. If samples were collected, data should be presented as it was for the preceding SWMUs.

12. Table 4-1, page 4-3 - The table needs more explanation. When were the tests conducted? What was the duration of the drawdown-recovery, slug and packer tests? What methods were used to analyze the data? What confidence intervals can be applied to the hydraulic conductivity values? Do the test interval footages correspond to screened intervals, sensing zones, saturated thicknesses within a well or confined zones intercepted by a well?
13. Page 4-4, Section 4.2 - The discussion of how bedrock dip was estimated needs to be revised. Well 5-87BR is not present in any of the cross-sections on Plate 4-3, and based on the cross-sections no correlations between the indicated wells can be made.
14. Page 4-5, last paragraph - Only one seep has been investigated at the 881 Hillside. Are there others? How does the location of buried paleo-channels correlate with soil gas plumes?
15. Page 4-7, Section 4.3.2 - In the discussion of vertical hydraulic gradients and associated ground water flow between alluvium and bedrock materials, it should be restated that despite the strong downward gradients, the hydraulic conductivity in the Arapahoe claystones is small enough and the conductivity differences between alluvium and bedrock are large enough that most alluvial ground water flows laterally along the alluvium/bedrock contact rather than flowing downward into the bedrock.
16. Page 4-9, Section 4.3.2 - More discussion should be provided on the concept of contaminant flow being dependent upon alluvial saturated conditions. Also, ground water flow through fractures and enhanced flow rates resulting from this should be discussed.
17. Page 4-12, Table 4-2 - The table needs to be revised to indicate (1) which data have been through data validation procedures; (2) what the "<" and "-" symbols indicate, (3) what the radiochemistry "+/-" results imply and why some of these pairs have such a large range; (4) field parameter (pH, T, SpC) data; and (5) suspected source of error for cation-anion balances higher than 10%

The text should address the mechanisms that might be controlling ground and surface water chemistry. Do the analyses indicate whether or not controlling mechanisms are present for the contaminants (e.g., complexation, precipitation, or adsorption of radionuclides)

18. Page 4-27, Section 4.5 - Contaminant flow velocities or at least effective ground water flow velocities, should be discussed. Some discussion of contaminant characteristics, degradation mechanisms, and retardation factors should be included as well

- 19 Page 5-1, last paragraph - Why were flow measurements not taken during May 1987? This could represent an important seasonal high flow period.
- Flow data (charts and/or tables would be useful) indicate wide variations with the downstream direction. However, the implications of this are not addressed. For example, could water be infiltrating and moving through the stream channel alluvium at certain locations? Water balance should be calculated on the interceptor ditch and Woman Creek. Also, what was precision of flow measurements, i.e., were replicate measurements performed?
20. Page 5-2, Section 5.1.2 - The radiochemistry results present in Appendix E-6 contain such large error ranges that interpretations of these data are virtually meaningless. The text should be revised to reflect this.
- 21 Table 5-2, page 5-4 - What do "-" (negative signs) indicate on tables? What are "ND", "NS", "NA", etc? The radionuclide data should contain error estimates, or reference Appendix E-6, which contains these numbers. Data indicate high levels of PO_4 for SW-C2 and SW-28 (20 mg/l). Implications are not discussed
- 22 Page 5-16, last paragraph - Tritium sediment samples are reported in pCi/ml. This should be pCi/gm, since this analysis is a solid, not water
23. Page 6-1, last paragraph, fourth sentence - Particulate sizes collected are not reflective of total exposures to the respiratory system (see General Comment #4).
- 23 Page 6-2, second paragraph - Of the 23 on-site samplers, 5 are analyzed bi-weekly for plutonium. How frequently are the remaining 18 samplers analyzed for plutonium?
24. Page 6-2, third paragraph, third sentence - Include reference for DCG for Wand Y plutonium classes
- 25 Page 6-5, Section 6.1.1 - The text needs additional evidence or quantification in order to justify the statement that "field activities are not contributing significantly to plutonium movement"
- 26 Page 6-7, last paragraph, second sentence - Respirable particle size should be ≤ 10 microns (see General Comment #4)
- 27 Page 8-6, third paragraph, second sentence - This statement cannot be verified with existing data
- 28 Page 8-7, third paragraph, second sentence - Is well 61-86 the same as 61-86A on Plate 4-1?

29. Page 8-7, third paragraph, fifth sentence - Define "clean".
30. Page 8-7, third paragraph, sixth sentence - What does VOC data from well 64-86 show? Wells 15-74 or 65-86 are not shown on Plate 4-1. What does VOC data from wells 15-74 and 65-86 show?
31. Page 8-8, Section 8.2.4 - The text should include a discussion of how the 18 hour flow time was derived for surface water traveling between stations SW-45 and SW-44. The argument of turbulence of surface water flow as a mechanism for volatilization is inconsistent with the flow rates presented, and should be revised or removed.
32. Page 8-9, last paragraph, second sentence - This conclusion has only been verified for organics
33. Page 8-11, first paragraph, third sentence - How was flow time calculated? Presumably, during most flow periods, the flow is much greater than 8 feet per hour.
34. Page 8-11, second paragraph, third sentence - What about health impacts to construction workers?
35. Plate 4-1 - The monitor well location map shows several wells that have been abandoned. How have these wells been abandoned? What were they grouted or plugged with? On what dates were they plugged?

REFERENCES

- Cowherd, C., Jr.; Muleski, G.E.; Englehart, P.J., and Gillette, P.A. 1984
Rapid Assessment of Exposure to particulate Emissions from Surface
Contamination Sites Office of Health and Environmental Assessment,
Washington, D C., February 1985
- Environmental Protection Agency (EPA). 1982. Air Quality Criteria for
Particulate Matter and Sulfur Oxides - Vol. 3, Env. Criteria and
Assessment Office December. EPA 600/8-82-029C.